

## Op amp boosted by added circuit

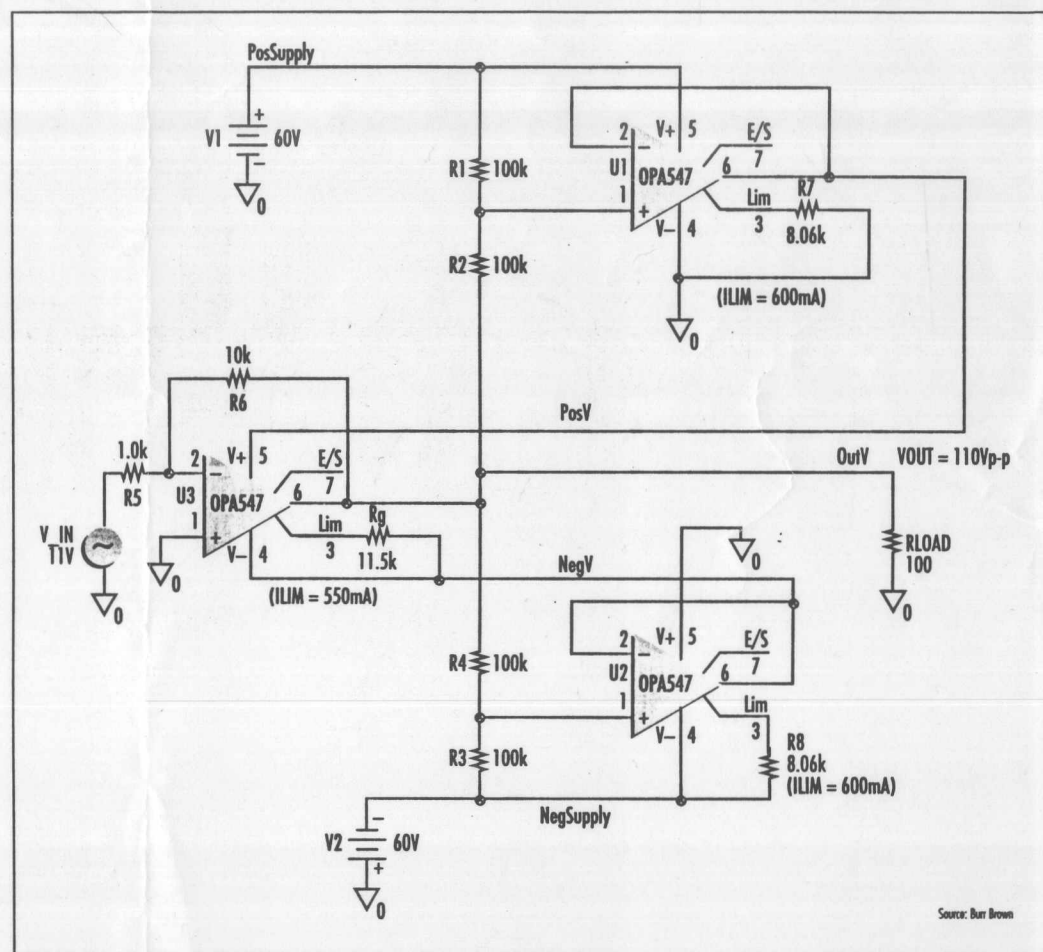
It is possible to get high-voltage performance from modest operational amplifiers with a bootstrap circuit. Three low-cost power amplifiers, such as the OPA547, can deliver over 110 V peak-to-peak signal into a ground-referenced load at full load current (500 mA), even though each amplifier is rated at 60-V maximum supply differential.

In this case, the signal amplifier, U3, can be configured in any closed-loop configuration (inverting, non-inverting), which main-

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tains the common mode voltage within the requirements for that amplifier. For simplicity, U3 is configured as a simple inverting gain of ten. Amplifier U1's output provides the positive power-supply voltage for the signal amplifier. That voltage is maintained at one-half of the voltage difference between the signal output and +60 V. Amplifier U2's output provides the negative supply voltage for U3 with a similar relationship to the -60-V supply. Thus, the total supply differential provided to U3 is maintained at 60 V for all signal levels. With that dynamic adjustment of the supply voltage applied to U3, its common mode voltage limit is also changing.



The maximum signal output can be predicted from the amplifier's output swing. For the OPA547, the maximum output voltage, at 500 mA, is  $V_{S+} - 2.2$  V and  $V_{S-} + 1.6$  V. That gives the

maximum supply-voltage range for U3 as +57.8 V and -58.4 V. Allowing for output voltage headroom requirements for U3, the maximum signal swing will be at least +55.6 V and -56.8 V. ■

## RESOURCES

*These Web sites provide information on IDB, the intelligent transportation system data bus*

## Versatile CPUs a critical ingredient for car multimedia

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requirement for keeping down the cost.

Another cost-saving requirement for the platform—one also achieved by the companion ASIC—is compatibility with legacy functions associated with the AM/FM radio and CD player.

other mass storage for movies and map data, CAN and GPS interfaces, and a multimedia bus interface for driving a color graphics display. Other interfaces, such as J1850, are candidates for the future ASICs.

Moreover, to skirt concerns arising from the